MINISTRY OF EARTH SCIENCES
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DR. HARSH VARDHAN AND SHRI Y.S. CHOWDARY RELEASE SEISMIC MICROZONATION REPORTS FOR DELHI AND KOLKATA; SAYS IMPACT OF EARTHQUAKES ON SOCIETY SHOULD BE MINIMIZED

The Union Minister for Science & Technology and Earth Sciences Dr. Harsh Vardhan released Seismic microzonation reports for Delhi and Kolkata in New Delhi today. Speaking on the occasion, he said such scientific endeavours should help us to minimize the impact of earthquakes by (a) Proper assessment of Seismic Hazard (b) Implementation of safe building construction codes, and (c) adopting appropriate land-use planning. The Minister complimented scientists and investigators involved in the Seismic Microzonation of NCT Delhi and the Kolkata Megacities.

Minister of state for Science and Technology and Earth Sciences, Shri Y.S. Chowdary said that the prediction of most of the natural events, particularly the earthquakes, is not possible, but the resulting damage due to them can be minimized by taking proper measures. Microzonation is one such measure where the emphasis on the impact of earthquake on the habitat is given.

It was seen that due to an earthquake in 1985 there was severe damage in Mexico city, though the earthquake source was located about 350 km away from the city. It was realized that putting a large region into a single seismic hazard zone is not a good idea. This and several other examples led to a new concept, called Microzonation. Seismic microzonation is a process of identifying such related geological, seismological, hydrological and geotechnical site characteristics in a specific region. These would help design of safe structures to reduce loss of human life.

Earlier a seismic zoning map for entire India was prepared and published by the Bureau of Indian Standards (BIS), classifying the entire country into 4 major groups Zone-V (High intensity) to Zone-II (Low intensity). These zones encompass wider area for which specific design spectra is commonly used, despite geological and geo-morphological variability within the respective zones.

Under the microzonation process various investigations viz, ambient noise survey, Multi-Channel Analysis of Surface Waves (MASW) survey, in-situ geotechnical testing, in-situ seismic measurements etc. were carried out and after analysis of data sets different maps viz., Peak Ground Acceleration (PGA), spectral accelerations for different periods, liquefaction potential, predominant frequency, amplification factor, average shear wave velocity at 30 meters depth, geology & geomorphology and projected Hazard Scenarios at GIS platform etc. have now been prepared.

National Capital Territory (NCT) Delhi is located in Seismic zone IV of the macro seismic zoning map of the country. The Earthquake Risk Evaluation Center (under the IMD), now merged with National Centre for Seismology, Ministry of Earth Sciences, undertook the microzonation of the NCT Delhi and generated an integrated seismic hazard map of Delhi using Peak Ground Acceleration, Amplification factor, Liquefaction Potential, Engineering Bedrock Depth, Site classification, Predominant Frequency, Geology and Geomorphology.

The city of Kolkata, another most urbanized and densely populated centre and a major industrial & commercial hub of the eastern & northeastern region of India was developed primarily along the eastern bank of the River Hooghly, right over the Ganges delta in the Bengal Basin. Unplanned urbanization defying building codes are continuously increasing the earthquake vulnerability of Kolkata placed at the border of Seismic Zone III and IV, necessitating systematic

assessment of seismic hazard, vulnerability and risk. The Seismic Microzonation project for the city of Kolkata was conceived by Indian Institute of Technology Kharagpur in consortium with a few other organizations in Kolkata under the aegis of the Geosciences Division, Ministry of Earth Sciences, Govt. of India with full financial support from the Ministry.

Beneficiaries of these microzonation maps would include:

- Disaster Mitigation & Management Authorities
- Urban Development Authorities
- Planning, Design & Construction Agencies
- Risk Assessment to existing life & Property
- Defense Installations
- Heavy Industry
- Public Utilities & Services

Secretary, Ministry of Earth Sciences, Dr. M.Rajeevan expressed happiness at the completion of microzonation of two huge cities in high risk zones.

Director, National Centre for Seismology, Ministry of Earth Sciences, Dr. V.K. Gahalaut, made a presentation on the report relating to Delhi and Prof. S.K. Nath of IIT Kharagpur gave details on Kolkata microzonation report.

They pointed out that we normally believe that the impact of earthquake decreases as we move away from the earthquake epicenter, but that was not always found to be true.

It was pointed out that on 25 October 2015, when an earthquake with magnitude 7.8 occurred in the Hindukush region in Afghanistan, more than 1000 km from Delhi, it shook Delhi so violently as if the earthquake occurred in close vicinity. Similar was the case of April 2015 Nepal earthquake.

Reports for Delhi & Kolkata can be accessed by clicking links here below:
http://moes.gov.in/report-and-publication/miscellaneous